Superfund Program Proposed Plan

Franklin Slag Pile
Philadelphia, Pennsylvania July 2007

INTRODUCTION

The United States Environmental Protection Agency Region III ("EPA") is issuing this Proposed Plan ("Plan") to identify its Preferred Alternative for addressing the slag pile at the Franklin Slag Pile Superfund Site ("FSP" or "Site"), in Philadelphia, Pennsylvania, and to provide the rationale for this preference. The Preferred Alternative is to cover the slag pile with a multilayer cover consistent with Resource Conservation and Recovery Act ("RCRA") hazardous waste landfills. In addition, this Plan includes summaries of other cleanup alternatives evaluated for this Site.

Dates to Remember:

July 19, 2007 - August 17, 2007
Public Comment period on alternatives in Proposed Plan.

July 25, 2007 at 6:30 pm
Public meeting
St George Parish Hall
3570 Salmon Street
(Salmon and Venango Streets)
Phila., PA, 19134

EPA is the lead agency for site activities, and the Pennsylvania Department of Environmental Protection ("PADEP") is the support agency. EPA, in consultation with PADEP, will select a final remedy for the Franklin Slag Pile Superfund Site in a Record of Decision ("ROD"). Before the final selection of a remedial alternative, EPA will consider written and oral comments on the Preferred Alternative presented in this Proposed Plan. EPA, in consultation with PADEP, may modify the Preferred Alternative or select another response action presented in this Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in the Proposed Plan.

PUBLIC PARTICIPATION

This Proposed Plan for the Franklin Slag Pile Superfund Site has been prepared by EPA to facilitate public participation in the decision-making process regarding remediation of the Site. The Proposed Plan: (1) fulfills the public notification requirements of Sections 113(k)(2)(B), 117(a), and 121(f)(1)(G) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA"); (2) describes the remedial alternatives evaluated in the Feasibility Study ("FS") and solicits comments on these alternatives; (3) identifies EPA's Preferred Alternative and explains why EPA prefers it; (4) solicits community involvement in selection of the remedy; and, (5) refers interested parties to the FS and other documents contained in the Administrative Record file.

EPA and the PADEP encourage the public to review the documents comprising the Administrative Record file for the Franklin Slag Pile Superfund Site to gain a more comprehensive understanding of the Site and the Preferred Alternative. The Preferred Alternative is based on the Remedial Investigation ("RI") Report and the Feasibility Study ("FS") Report dated June 2007. The RI/FS Report and other documents comprising the Administrative Record for this Site are available for review at the information repository located in the EPA Region III offices in Philadelphia, Pennsylvania and in the Port Richmond Branch of the Philadelphia Free Public Library. The Administrative Record file can be reviewed at either of the following locations:

EPA Region III
1650 Arch Street
Attn: Anna Butch
Administrative Record Center (6th Floor)
Philadelphia, Pennsylvania 19103
phone: 215-814-3157

Port Richmond Branch of the Philadelphia
Free Public Library
2987 Almond Street
Philadelphia, Pennsylvania 19134
phone: 215-685-9992

The Administrative Record can also be accessed via the internet by going to the following website address: http://www.epa.gov/arweb

General information on the Franklin Slag Pile site can be found at EPA's website: http://www.epa.gov/reg3hwmd/super/sites/PASFN0305549/index.htm

Interested parties may comment during the public-comment period which begins on **July 19, 2007** and closes on **August 17, 2007.** On **July 25, 2007** at 6:30 p.m. EPA will hold a public meeting to discuss the remedial alternatives. It will be held at the **St George Parish Hall at 3570 Salmon Street (Salmon and Venango Streets) Philadelphia, PA 19134**.

EPA, in consultation with PADEP, may modify the Preferred Alternative, or develop another alternative, if public comment warrants such an action, or if new information becomes available.

SITE HISTORY

The Franklin Slag Pile site ("FSP" or "Site") is located in the Port Richmond section of northeast Philadelphia, Pennsylvania. FSP is located at the intersection of Castor and Delaware Avenues. The FSP site is bordered by a Conrail rail line to the north; by the closed lagoons belonging to the Philadelphia Water Department (PWD) Northeast Water Pollution Control Plant (NEWPCP) to the north and east; by Delaware Avenue and Tioga Marine Terminal to the southeast; by Castor Avenue, portions of the former Franklin Smelting & Refining Company (FSRC), and the Philadelphia Gas Works (PGW) to the southwest; and by former Franklin Smelting & Refining Company to the northwest. The Delaware River is less than 1/4 mile to the southeast. The closest residents are at the intersection of Castor Avenue and Richmond Street which is approximately a 1/4 mile from the Site.

The FSP site consists of a large pile of slag situated on an approximately four-acre lot. The volume of the slag pile is estimated to be about 68,000 cubic yards. The slag pile is approximately 250 feet wide by 350 feet long and varies in height from 10 to 40 feet. The slag pile is covered with a 60-millimeter high density polyethylene (HDPE) cover, the perimeter of the slag pile is covered with stone, and an 8-foot high fence with barb-wire surrounds the property.

The slag was generated as a by-product from a secondary copper smelter at FSRC which was located at 3100 Castor Avenue adjacent to the northwestern border of the slag pile. FSRC which operated from the 1930's until 1997 made products including blister and black copper, mineral grit, converter slag, zinc oxides, and ammonium sulfate. FSRC started depositing a mineral grit or by-product of the smelting process in a pile at the present FSP property beginning as early as the 1930's. An aerial photograph from 1959 shows a visible pile.

MDC Industries (MDC) sold the slag on a consignment basis for FSRC. MDC processed and sold the slag from the 1950's to 1999 at the intersection of Castor and Delaware Avenues. MDC dried, crushed, and sorted the slag and then sold the slag as sand-blasting grit by the truckload and in 50-pound bags, under the name of Polygrit.

While MDC operated, material from the slag pile was observed to have migrated off the property on all four sides of the FSP site. The sidewalk between MDC and Delaware Avenue was covered in black slag material. The storm drains along Castor and Delaware Avenues which empty directly into the Delaware River transported slag material. MDC was cited by EPA Region III Water Protection Division (WPD) in 1999 for releasing lead in storm water run-off that discharged into the Delaware River. Slag was also observed on the neighboring PWD property.

SITE CHARACTERISTICS

On October 15 and 16, 1997, EPA conducted an inspection of both the FSRC and MDC properties. Three samples were collected at MDC: one sample was collected directly from the

slag pile; the second sample was collected from the access road along the northern property boundary where the slag material had spilled beyond a fence; and the third sample was collected from the sediments in a storm drain on Delaware Avenue where a trail of slag had migrated from the pile. All three of these samples exceeded the Toxicity Characteristic Leaching Procedure ("TCLP") level of 5 milligrams per liter ("mg/l") for lead. Exceedance of the TCLP level of 5 mg/l indicates the slag is a hazardous waste by characteristic.

The PADEP and the City of Philadelphia also inspected the MDC facility. In February 1988, PADEP sampled the PWD property adjacent to MDC and found lead levels above the 5 mg/l standard for a leaching procedure that was a predecessor test to the TCLP. In April 1995, PADEP collected five samples from the slag pile at the MDC property. All samples exceeded the TCLP level for lead with results ranging from 5.7 mg/l to 86.6 mg/l. Using an analytical method to quantify the amount of metals in the slag, total lead values ranged from 5,010 mg/Kg to 27,500 mg/Kg (milligrams per Kilogram). From January through March of 1998, the Philadelphia Fire Department Hazardous Materials Administrative Unit ("HMAU") investigated both the FSRC and MDC properties. A March 16, 1998 HMAU memorandum states that a black substance was passing through MDC's fence. In August 1999, PADEP again took samples from the slag pile. All five samples exceeded the TCLP level for lead with lead results ranging from 17.5 mg/l to 44.7 mg/l. Using an analytical method to quantify the amount of metals in the slag, total lead values ranged from 4,861 mg/Kg to 8,150 mg/Kg.

EPA sampled the slag pile and collected samples of Polygrit during a second inspection on June 10 and 11, 1998. Ten composite samples were collected from the pile. All ten samples contained levels of lead that exceeded the TCLP level of 5 mg/l for lead with values ranging from 15.6 mg/l to 36.9 mg/l. In addition, four grab samples of the Polygrit were collected from bags. All four Polygrit samples contained lead levels that exceeded the TCLP level of 5 mg/l with values ranging from 5.4 mg/l to 8.9 mg/l.

In August 1998, EPA returned to the MDC property to evaluate the potential for the storm water run-off to transport the slag off the property. This inspection revealed pathways for the slag to migrate from the pile into the surrounding areas. Slag from the pile was found in storm drains that flowed directly into the Delaware River which is less than 1/4 mile from the MDC property.

As a result, on September 13, 1999, EPA issued MDC a Finding of Violation and Order for Compliance under the Clean Water Act ("CWA"). The Order required MDC to control discharges to the storm drains and place covers over the slag pile. EPA also issued an Administrative Complaint to MDC on September 13, 1999, assessing penalties for past discharges.

MDC stated to EPA that it intended to take no action to control or stabilize the threats posed by the slag pile. Additionally, MDC submitted information stating that it closed the plant on December 30, 1999, and was unable to pay for any clean-up.

As a result, from January to October of 2000, EPA initiated an emergency removal action at the MDC property to stabilize the slag pile and to prevent further off-site migration of slag material. During the emergency response, slag from the pile was observed to have migrated beyond the property on all sides. In addition, winds were observed carrying black dust clouds of slag material off the property. Storm drains were full of slag material. EPA reconfigured the slag pile, then encapsulated it and covered it with a high density polyethylene (HDPE) cover. EPA also installed a fence around the slag pile. Buildings and equipment were decontaminated by vacuuming or pressure washing. Structures and buildings that were structurally unsafe or physically impossible to access were dismantled before decontamination. EPA shipped slag, contaminated soil, and contaminated debris off-site for disposal and transported cleaned scrap steel to a local recycling facility. EPA drained fuels and oils from abandoned equipment, drummed the fuels and oils, and transported them off-site for fuel blending. EPA cleaned out drainage sumps, manholes, and concrete overflow boxes. EPA installed silt fencing to prevent slag migration off-site and used a street sweeper to clean the perimeter, including Delaware and Castor Avenues. EPA also decontaminated Conrail's railroad tracks. EPA excavated soil at the PWD's NEWPCP property and then backfilled the area with stone. EPA modified the storm drains surrounding the property to prevent slag from migrating off-site via stormwater and installed a surface water control system along Castor Avenue to reduce potential contamination into storm drains. During these efforts, EPA transported and disposed of in a landfill nearly 13,000 tons of contaminated soil and slag, 246 tons of hazardous debris, 20 tons of abandoned Polygrit, and 40 cubic yards of used personal protective equipment.

As one of the first emergency response actions, EPA, on January 5, 2000, collected 10 samples of the slag at the MDC property. The samples were collected in order to determine the potential hazards of the slag and its associated impact on the environment.

All samples collected were analyzed using the TCLP and were found to contain lead concentrations greater than the TCLP level of 5 mg/l. The lead TCLP results ranged from 6.01 mg/l to 21.3 mg/l. There was also one value of cadmium of 3.24 mg/l that was above the cadmium TCLP level of 1.0 mg/l. Using an analytical method to quantify the amount of metals in the slag, EPA detected total lead values in the range from 4,200 mg/Kg to 22,100 mg/Kg. All samples contained copper, iron, and zinc in concentrations above their respective Risk-Based Concentration ("RBC") levels. One slag sample was analyzed for contaminants other than metals including: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs). None of these substances exceeded TCLP levels and none exceeded EPA's RBCs.

When both FSRC and MDC were in operation, the City of Philadelphia's Air Management Services Laboratory recorded the highest concentrations of airborne lead and particulates in Philadelphia County in the samples collected around these facilities. The National Ambient Air Quality Standard (NAAQS) for lead is a quarterly average of 1.5 µg/m3 (microgram per cubic meter of air). The quarterly average lead concentrations in air near the facilities from 1994 through 1997 ranged from approximately 5 µg/m3 to10 µg/m3, with a high of 22 µg/m3 in the fourth quarter of 1994. While the closure of the FSRC reduced the amount of

airborne particulates and lead in the area dramatically, attainment of the lead NAAQS was not reached until the slag pile was covered with a HDPE cover by EPA in 2000. Once the FSRC was closed, the area was able to attain the annual average PM10 NAAQS of 50 µg/m3. PM10 are airborne particulate matter less than 10 micrometers in diameter. They pose a health concern because they can be inhaled and accumulate in the respiratory system. The ambient air concentration of PM10 fell well below the standard after the slag pile was covered in 2000. An air monitor was located at Richmond Street and Wheatsheaf Lane to measure ambient air concentrations of lead at the nearest Port Richmond residential area to both FSRC and MDC. While this monitor always showed attainment of the lead NAAQS in the residential area, when the FSRC closed, the monitor recorded a significant reduction of ambient lead concentrations. This monitor was decommissioned in the second quarter of 1999.

The Agency for Toxic Substances and Disease Registry ("ATSDR"), in conjunction with the Pennsylvania Department of Health ("PADOH"), prepared a Public Health Assessment ("PHA") for the Site. ATSDR and PADOH held a public availability meeting on November 19, 2003 in the Port Richmond section of the City of Philadelphia to provide the community with an opportunity to review and comment on an earlier version of the PHA. The final PHA was issued by ATSDR on May 24, 2005 and stated that current on-site exposure does not pose a public health hazard since the slag pile is covered and is securely fenced.

EPA proposed the FSP to the National Priorities List ("NPL") on September 13, 2001 and added FSP to the NPL on September 25, 2002.

As part of the RI, EPA collected six soil samples outside of the fenced FSP site. Two samples were collected on a strip of land between the fence and the curb on Delaware Avenue (SS-1, SS-4); one sample and a duplicate sample were collected on the PWD property (SS-2, SS-3); and two samples were collected along the railroad tracks (SS-5, SS-6). All the samples were analyzed for metals, VOCs, SVOCs, pesticides, and PCBs. The off-site soil samples, SS-2 and SS-3, showed the lowest concentrations of metals: aluminum at 3630 mg/Kg, lead at 117 mg/Kg, and manganese at 604 mg/Kg. The off-site soil samples, SS-1 and SS-4, showed elevated levels of metals: aluminum from 15,200 mg/Kg to 18,100 mg/Kg, lead from 699 mg/Kg to1,690 mg/Kg, manganese from 698 mg/Kg to 737mg/Kg. The off-site soil samples collected furthest from the FSP site by the railroad tracks (SS-5, SS-6) showed the highest concentration of metals: aluminum from 12,800 mg/Kg to 28,800 mg/Kg, lead from 773 mg/Kg to 2,090 mg/Kg, and manganese from 651 mg/Kg to 1,580 mg/Kg.

SUMMARY OF SITE RISKS

As part of the RI/FS, a risk assessment was conducted to estimate the potential risk to human health and the environment as a result of the high levels of metals from the slag pile.

Ecological Risk Assessment:

An ecological risk assessment ("ERA") was performed for the FSP site following EPA's

risk assessment guidance. The first two steps in the ecological risk assessment process which are referred to as a screening level ecological risk assessment were performed. The conclusion from the screening ecological risk assessment is that any ecological risk posed by the FSP site is negligible. The conclusion of the ecological risk assessment is based on the fact that the slag pile is covered with a HDPE cover and that there is a lack of natural habitat on the FSP site. While the ecological risk is negligible, a permanent remedy is required in order to ensure long-term protection of the environment.

Human Health Risk:

A human health risk assessment was prepared as part of the RI Report to evaluate the potential human health impacts that could result from exposure to the slag. A human health risk assessment was also performed to characterize the potential risks to likely human receptors under current and future land use. A human health risk assessment involves assessing the toxicity, or degree of hazard, posed by hazardous substances related to the site, and describes the routes by which humans could come into contact with these substances.

In accordance with EPA Region III guidance, risk-based screening was performed to identify chemicals of potential concern ("COPCs") in the slag that required further evaluation during the risk assessment. Potential receptors and exposure pathways were identified based on current and future land use. Exposure routes (i.e., ingestion, dermal contact and inhalation) were evaluated, as appropriate, for the populations potentially affected by the slag. Human receptors evaluated during the risk assessment were: 1) construction worker, 2) adolescent trespasser, and 3) child and adult recreational user. Calculations are made for substances that cause cancer and for substances that cause an adverse non-cancer health effect.

Carcinogenic risk:

For substances that cause cancer (carcinogens), EPA's acceptable range for carcinogenic risks is $1x10^{-4}$ to $1x10^{-6}$. A $1x10^{-4}$ carcinogenic risk means that 1 person in 10,000 would have an increased risk for cancer, while a $1x10^{-6}$ carcinogenic risk means that 1 person in 1,000,000 would have an increased risk for cancer. The cancer risks from potential exposure to slag were within EPA's acceptable range. If a local child playing near the site were regularly exposed to soil at one location outside the fence on Delaware Avenue, the increased cancer risk of approximately $3x10^{-4}$ (or three in ten thousand) could exceed EPA's acceptable range. However, this risk is largely due to polyaromatic hydrocarbons (PAHs). Note that PAHs, which are found in combustion products, are not site-related and may be the result of contributions from traffic along Delaware Avenue.

Noncarcinogenic risk:

EPA also evaluates the risks of effects other than cancer (noncarcinogenic effects) from chemical exposure. Examples of noncarcinogenic effects include rashes, stomach trouble,

kidney damage, liver damage, etc. Most of these noncarcinogenic risks are assessed using the "Hazard Quotient" (HQ). The HQ compares the estimated exposure dose from the site to a "Reference Dose" (RfD). The RfD is the dose at which effects are not expected to occur. Therefore:

HQ = Estimated exposure dose / RfD

The HQ is calculated for each chemical, and the HQs are added for a total Hazard Index or HI. Ultimately, only chemicals that affect the same target organs are added together. The goal is for the HI to be 1 or less. In other words, EPA does not want exposure from the site to exceed the RfD. When the HI exceeds 1, it does not necessarily mean that effects will occur, but they can no longer be ruled out with confidence.

EPA evaluated the risks if construction workers were to be exposed to the slag, and found the total HI to be approximately 31. This risk was largely due to inhalation of dust. Aluminum, beryllium, chromium, cobalt, copper, iron, and manganese were the chemicals that contributed most significantly to the HI of 31. Manganese with a HQ of 18 contributes the most to the overall HI. Therefore, EPA calls these metals chemicals of concern.

Lead was a significant contributor to noncancer risk, but not to the HI, since lead risk is evaluated with a blood-lead model. Exposure to lead in the slag by construction workers was evaluated using EPA's lead model. The lead model estimates lead levels in blood in adults. Blood-lead levels greater than 10 micrograms of lead per deciliter of blood or 10 µg/dl are considered to be a concern. EPA's goal is for no more than 5% of the projected population to exceed 10 µg/dl blood lead. Results of the adult lead model analysis indicate that blood-lead levels for children (fetuses of exposed woman) exceeded the level of concern (10µg/dl) from exposure to lead in slag. Therefore, lead is also a chemical of concern.

Therefore, EPA calls these metals: aluminum, beryllium, chromium, cobalt, copper, iron, manganese, and lead, chemicals of concern for the Franklin Slag Pile site, and the remedy must address them.

Table 1 - Summary of Human Health Risk Assessment

Chemical of Concern in Slag	**Impact on Human Receptor**	**Comment**
Aluminum	Construction worker HQ = 3	inhalation of fugitive dust
Beryllium	Construction worker HQ = 3	inhalation of fugitive dust
Chromium	Construction worker HQ = 0.6	inhalation of fugitive dust
Cobalt	Construction worker HQ = 3	inhalation of fugitive dust

Copper	Construction worker HQ = 1	ingestion
Iron	Construction worker HQ = 2	ingestion
Manganese	Construction worker HQ = 18	inhalation of fugitive dust
Lead	More than 5% of the fetuses born to construction workers predicted to have blood lead levels greater than 10ug/dl	risk to construction worker based on average concentration in slag samples

It is important to note that: 1) the HIs were calculated using conservative assumptions about the frequency and duration of exposure; and, 2) the toxicity criteria for a few risk drivers at the Site (e.g. aluminum and iron) were provisional and therefore have less confidence than the toxicity criteria for other chemicals.

The risk assessment also showed that soils located outside the fenced FSP site contained concentrations of metals (primarily aluminum, lead, and manganese) that would pose an unacceptable risk to construction workers due to inhaling metals adhered to dust particles. Two samples were collected on a strip of land between the fence and the curb on Delaware Avenue (SS-1, SS-4); one sample and a duplicate sample were collected on the PWD property (SS-2, SS-3); and two samples were collected along the railroad tracks (SS-5, SS-6). All the samples were analyzed for metals, VOCs, SVOCs, pesticides, and PCBs. The sample taken at SS-6 furthest from the FSP site along the railroad tracks was the most contaminated soil sample, with metals of concern being aluminum, chromium, cobalt, copper, iron, manganese, and lead. In most of these off-site soil sample locations, such as along Delaware Avenue or along the railroad track, it is unlikely that the soils could be excavated in sufficient quantities in order to pose a significant exposure to a construction worker. At several of these off-site soil sample locations the land is covered with stone that was placed by EPA during the emergency removal action in 2000. It is possible that the metals in these off-site soil samples are the result of a background condition since manganese is a commonly occurring metal. It is also possible that the metals in these off-site soil samples are the result of urban sources in this area such as the railroad, streets, and industrial businesses.

It is the EPA's judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health from actual or threatened releases of hazardous substances in the slag into the environment.

SCOPE AND ROLE OF RESPONSE ACTION AND REMEDIAL ACTION OBJECTIVES

The Preferred Alternative described in this Proposed Plan will address the threats posed by the release of hazardous substances in the slag at the Franklin Slag Pile Site. The ROD that will be issued after the public comment period for this Proposed Plan will be the final action planned for this Site. EPA plans to issue a ROD for the Site that will include the following Remedial Action Objectives ("RAOs"):

- Prevent future potential human exposure to metals in the slag material.
- Prevent future potential release of metals to the environment from the slag pile.

SUMMARY OF REMEDIAL ALTERNATIVES

The Superfund process requires that the alternative selected to cleanup a hazardous waste site must meet several criteria. The alternative must protect human health and the environment, be cost effective, and meet the requirements of environmental regulations. Permanent solutions to contamination problems should be developed wherever possible. The solutions should reduce the volume, toxicity, or mobility of the contaminants. Emphasis is also placed on treating the wastes at a site, whenever possible, and on applying innovative technologies to cleanup the contaminants.

The FS evaluated several remedial alternatives. These remedial alternatives for the FSP are presented below and summarized in Table 2. The alternatives are numbered to correspond with the numbering used in the FS Report. Alternative 4, a RCRA cap, is EPA's Preferred Alternative. The total net present worth cost figures have been rounded up from the cost figures in the FS.

TABLE 2
SUMMARY OF REMEDIAL ALTERNATIVES
Franklin Slag Pile Site

FS Designation	Description	Total Net Present Worth Cost
1	No Action	0
2	Limited Action	$524,000
3	Complete Removal and Off-Site Treatment and Disposal at RCRA landfill	$31,000,000
4	**RCRA Cap**	**$5,650,000**
5	On-site Treatment and Off-site Disposal at a Non-hazardous Waste Landfill	$18,000,000

Alternative 1 - No Action

Capital Cost:	**$0**
Annual O&M Costs:	**$0**
Total Net Present Worth Cost:	**$0**

The Superfund program is required to evaluate a "No Action" Alternative to determine the need for remediation at a site and to serve as a baseline for all other alternatives to be compared (see 40 C.F.R.§ 300.430). No further remedial measures would be implemented under this alternative. There are no Applicable or Relevant and Appropriate Requirements (ARARs) associated with this no action alternative.

The following four alternatives remediate the slag pile by either maintaining the existing cover or placing a new cover over the slag pile or by removing the slag and disposing it at an appropriate landfill. Alternatives 2 and 4 rely on covering the slag pile and Alternatives 3 and 5 rely on disposing of the slag.

Alternative 2 - Limited Action

Capital Cost:	**$488,635**
Annual O&M Costs (Years 1-30):	**$9,350**
Five Year Review Costs:	**$25,470**
Total Net Present Worth Cost:	**$524,000**

This alternative consists of the following:

- HDPE cover maintenance and complete cover replacement, if needed
- Fence maintenance
- Institutional Controls
- Long-term periodic monitoring and sampling, if needed, and
- Five-Year Reviews.

Alternative 2, Limited Action, relies on long-term monitoring and maintenance of the current HDPE cover and perimeter fence to limit potential exposure to the slag pile. Long-term monitoring of the cover would be conducted and repairs would be made. The alternative does include a complete replacement of the HDPE cover, if needed. In addition institutional controls, (such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP) would be implemented in order to protect the remedy and prevent exposure to site contaminants. Five-year reviews would be conducted to evaluate site conditions as required by CERCLA §121 and 40 C.F.R.§ 300.430(f)(4)(ii) since contaminants would be left in place. The alternative could be implemented almost immediately since the majority of the actions are maintaining the existing cover. Implementing institutional controls would require an estimated six months.

Alternative 3 - Complete Removal and Off-Site Treatment and Disposal at RCRA Landfill

Capital Cost:	**$31,000,000**
Annual O&M Costs	**Zero**
Total Net Present Worth Cost:	**$31,000,000**

This Alternative consists of the following:

- Excavation of slag material and contaminated underlying soil
- Transport, treatment, and disposal of excavated materials in a RCRA hazardous waste landfill.
- Removal and disposal of HDPE cover in non-hazardous solid waste landfill.
- Site regrading, vegetation establishment, and fence around the property
- Institutional controls.

Alternative 3, Complete Removal and Off-Site Treatment and Disposal at RCRA landfill, would involve the excavation and removal of the slag pile material. The slag is a hazardous waste by characteristic since the lead values exceed the TCLP standard of 5 mg/l. As a result, the excavated material would be transported by trucks to a RCRA landfill. At the RCRA landfill, the slag as a RCRA characteristic waste would be treated to meet the TCLP criteria and then disposed. It is estimated that the slag pile contains over 100,000 tons of material that would need to be transported to a RCRA facility. Once excavation begins, Alternative 3 would take over one year to complete. Upon completion of Alternative 3, the property would meet industrial clean-up levels and could therefore be re-used for industrial purposes. Institutional controls would be established to notify future property owners that the property was originally a site containing hazardous waste and that the site was remediated to industrial cleanup levels.

Alternative 4 - RCRA Cap

Capital Cost:	**$5,446,670**
Annual O&M Costs (Years 1-30):	**$11,450**
Five Year Review Costs:	**$19,970**
Total Net Present Worth Cost:	**$5,650,000**

This alternative consists of the following:

- Grading and excavation of pile to meet slope requirements
- Transport, treatment, and disposal of any excavated materials to RCRA hazardous waste landfill.
- Placement of multilayer RCRA cover.
- Removal and disposal of HDPE cover in non-hazardous waste landfill.
- Fence
- Long-term maintenance, periodic soil sampling, and long-term groundwater monitoring consistent with RCRA landfill closure requirements.

- Five-Year Reviews
- Institutional controls

Alternative 4, RCRA Cap, is EPA's Preferred Alternative in this Proposed Plan. Alternative 4, RCRA Cap, would include the removal of the current HDPE cover and disposal of the cover in a nonhazardous waste landfill. In order to meet the slope requirements for the covered slag pile, slag could be excavated, transported, treated, and disposed at a RCRA landfill. The slag is a hazardous waste by characteristic, since the lead values exceed the TCLP standard of 5 mg/l. As a result, the excavated material would be transported by trucks to a RCRA landfill. At the RCRA landfill, the slag as a RCRA characteristic waste would be treated to meet the TCLP criteria and then disposed. It is estimated that 10% of the slag would be removed to meet appropriate slope requirements. An appropriate multilayer RCRA cover will be developed during the remedial design. RCRA covers typically consist of a single geosynthetic clay liner (GCL), a single 60-millimeter LLDPE (linear low density polyethylene) friction membrane, and a 24-inch layer of soil. The soil would be seeded with vegetation such as grass. To the extent practicable native species would be planted on the cover. A fence would be used to limit access. Long-term monitoring and maintenance of the cap would be conducted. Long-term monitoring and maintenance would include site inspections to evaluate the cover and drainage. Also, as part of the RCRA landfill closure requirements, groundwater wells would be installed and groundwater would be monitored for the long-term. During the remedial design, the appropriate number and locations for the groundwater wells will be determined. The groundwater wells will be installed during the remedial design and sampled in order to collect a baseline set of data prior to the construction of the remedy. Also, during the remedial design additional locations will be sampled to further characterize the metals levels in background soils. The remedy will also include institutional controls, (such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP). Institutional controls would be implemented in order to protect the remedy and prevent exposure to site contaminants. In addition to the regular site maintenance and monitoring, five-year reviews would be conducted to evaluate site conditions, since contaminants would be left in place. Once construction begins, it would take about one year to implement Alternative 4.

Alternative 5 - On-Site Treatment and Off-Site Disposal at a Non-Hazardous Waste Landfill

Capital Cost:	**$18,000,000**
Annual O&M Costs	**Zero**
Total Net Present Worth Cost:	**$18,000,000**

This alternative consists of the following:

- Excavation and on-site treatment of slag and contaminated soil to meet RCRA TCLP criteria.
- Transport and disposal of treated materials to a non-hazardous waste landfill.
- Removal and disposal of HDPE cover in non-hazardous waste landfill.

- Site regrading and vegetation establishment
- Institutional controls
- Fence

Alternative 5, On-site Treatment and Off-site Disposal at a Non-hazardous Waste Landfill, would provide for excavation and on-site treatment of the slag to meet the TCLP criteria. The treated slag material would be transported by trucks and disposed in a non-hazardous waste landfill. An appropriate stabilization agent and mix ratio would need to be determined during treatability testing. During the remedial design, testing would need to be performed to determine what stabilizing agent would be most effective for treating the metals in the slag. EPA has already gathered information on the treatment of the slag from the treatability study conducted by EPA's Office of Research and Development (ORD). The information in the ORD treatability study would be a starting point. There are standard commercial products available to stabilize the metals in the slag such as cement, lime-kiln, or phosphate chemicals. During the ORD treatability study triple sodium phosphate (TSP) was used to stabilize the slag. The slag would be mixed on-site with a stabilizing agent. During the remedial design an appropriate method will be evaluated and selected to treat the slag such as a pug mill or mixing pad. In Alternative 5 the slag would be treated on-site whereas in Alternative 3 and 4 the slag would not be treated on-site, but at the landfill. Upon completion of Alternative 5, the property would meet industrial clean-up levels and could therefore be re-used for industrial purposes. Institutional controls would be established to notify future property owners that the property was originally a site containing hazardous waste and that the site was remediated to industrial cleanup levels. Once excavation begins, Alternative 5 would take over one year to complete.

ALTERNATIVES EVALUATED AND ELIMINATED

EPA did evaluate several other alternatives that were eventually eliminated since they did not meet regulatory requirements. One of these alternatives (referred to as Alternative 6, on-site treatment and PWD disposal in the FS Report), involved treating the slag with blends of soil; sludge from the PWD lagoons; and TSP and then disposing the treated slag in a lagoon located at the PWD's NEWPCP. Ultimately, EPA determined that Alternative 6 did not meet PADEP regulations for residual waste landfills. In addition, there were a series of implementation constraints to dispose of the treated slag in the sludge lagoons. EPA consulted with the City of Philadelphia on this alternative since as the landowner the City would be responsible for applying for the appropriate landfill permit and performing operation and maintenance of the landfill. The City decided they did not want to pursue this alternative further. Appendix D of the FS Report includes additional information on Alternative 6.

EPA also compared the analytical results of the slag to Pennsylvania's general permit requirements to evaluate the potential to reuse the slag. Pennsylvania has general permits for the reuse of steel or iron slag for construction (WMGR005) and a general permit for the reuse of waste foundry slag for use in road construction (WMGR032). The total lead results of the slag exceeded the general permit levels acceptable for reuse. For example, the total lead results in the slag ranged on average from 2,000 - 4,000 mg/Kg and the general permit requirement is 200

mg/Kg of lead. Therefore, the total lead values of the slag exceeded the state general permit requirements and the reuse alternative was eliminated.

EVALUATION OF ALTERNATIVES

Five remedial alternatives were evaluated in detail to determine EPA's preferred alternative for addressing the risks posed by the slag at the Site. In this section, the remedial alternatives, presented in the FS and summarized above, are compared to each other using seven of the nine criteria EPA uses in the decision-making process. The last two criteria, which are State and community acceptance, will be evaluated after the end of the public comment period. This section of the Proposed Plan summarizes the relative performance of each alternative against the seven criteria, noting how it compares to the other options under consideration. For additional information on the comparison of the remedial alternatives refer to the FS Report.

The alternatives described in this Proposed Plan were evaluated using the criteria set forth in 40 C.F.R. § 300.430 (e)(9)(iii). The nine criteria are:

Threshold Criteria:

1. Overall protection of human health and the environment - Addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. Compliance with applicable or relevant and appropriate requirements (ARARs) - Addresses whether a remedy will meet all of the ARARs of Federal and State environmental laws and/or justifies a waiver.

Primary Balancing Criteria:

3. Reduction of toxicity, mobility or volume through treatment - Addresses the anticipated performance of the treatment technologies a remedy may employ.
4. Implementability - Addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option
5. Short-term effectiveness - Addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.
6. Long-term effectiveness and permanence - Addresses expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.
7. Cost - Includes estimated capital and operation and maintenance costs, as well as present worth costs.

Modifying Criteria:

8. State acceptance - Indicates the support agency's comments. Indicates whether, based on its review of the FS and Proposed Plan, the State concurs with, opposes, or has no

comments on EPA's preferred alternative.

9. Community acceptance - Summarizes the public's general response to the alternatives described in the Proposed Plan and Remedial Investigation/Feasibility Study Report.

These evaluation criteria relate directly to requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, for determining the overall feasibility and acceptability of a remedy. Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between remedies. The modifying criteria are formally taken into account after public comment is received on the Proposed Plan.

1. **Overall Protection of Human Health and the Environment**

Alternatives 2, 3, 4, and 5 would provide overall protection of human health and the environment. Alternative 1 (No Action) would only provide protection of human health and the environment for the short-term until the HDPE cover deteriorates.

2. **Compliance with Applicable or Relevant and Appropriate Requirements ("ARARs")**

Alternative 1 (No Action) takes no action and as a result there are no ARARs associated with the alternative. Alternative 2 is not compliant with regulatory standards for capping hazardous waste, since the cover is currently a single cover of HDPE and not a multilayer cover as required in Pennsylvania landfill regulations or RCRA capping requirements. In addition, the current side slopes of the slag pile are greater than the state regulatory maximum of a 33% slope. Alternative 3 would meet ARARs associated with handling and preparing to send off-site the slag material, particularly with respect to dust suppression and containerizing prior to shipment. Like Alternative 3, Alternative 4 would meet ARARs associated with handling and preparing to send off-site the slag material. Alternative 4 would also comply with ARARs for hazardous waste landfill requirements for the final RCRA cap, including requirements for slopes, drainage, permeability, groundwater monitoring and closure and post-closure care. Like Alternative 3, Alternative 5 would meet ARARs associated with the handling of the slag material. Alternative 5 would also meet ARARs associated with on-site treatment of the slag by complying with the RCRA TCLP requirements.

Alternatives 1 and 2 do no meet the threshold criteria of protection of human health and the environment and compliance with applicable or relevant and appropriate requirements. Therefore, Alternatives 1 and 2 will not be further evaluated against the following criteria.

3. **Long-Term Effectiveness and Permanence**

Alternatives 3, 4, and 5 all offer long-term protection of human health and the environment. Alternatives 3 and 5 provide this protection by the removal and disposal of the slag in an appropriate permitted landfill. Alternative 4 provides this protection by covering the slag pile with a RCRA cap. Alternatives 3 and 5 provide for better long-term protection and permanence since the slag will be disposed in a landfill rather than covered in place as in

Alternative 4.

4. **Short-Term Effectiveness**

Alternative 3 and 5 would have the potential for short-term impact due to the excavation and off-site disposal of the slag. Once work begins, Alternatives 3 and 5 are estimated to take over one year to implement and Alternative 4 is estimated to take almost one year to implement. Both Alternative 3 and 5 would include controls such as dust suppression and placement of a tarp over the slag pile in order to mitigate the release of the slag to the environment and to protect worker safety. During the emergency removal action in 2000 EPA implemented these types of control measures. Alternative 4 includes the excavation of a small portion of the slag pile in order to meet the slope requirements compared to the entire pile being excavated in Alternatives 3 and 5. Again, controls such as dust suppression would be used to limit the exposure to the slag. For Alternative 3, 4, and 5 workers would use appropriate personal protective equipment (PPE) during work on the site.

5. **Reduction of Toxicity, Mobility or Volume**

Alternatives 3, 4, and 5 include the treatment of the slag. As a result, there would be reduction of toxicity and mobility for Alternatives 3, 4, and 5. For Alternatives 3 and 4 the slag would be treated off-site at a RCRA landfill and for Alternative 5 the slag would be treated on-site. For Alternatives 3, 4, and 5 the slag would be treated to stabilize it and reduce the leachability of the metals in order to meet the TCLP requirements. By reducing the leachability of the metals in the slag the mobility of the metals would be reduced. The stabilizing agent to treat the slag would add volume making the total volume of the slag greater; however, the volume of contaminants would not be increased. For Alternative 5 once the slag is treated it will not remain on-site, but will be transported and disposed in a nonhazardous waste landfill. Alternatives 3 and 5 would treat the entire slag pile and Alternative 4 would treat only a small portion of the slag as a method for meeting the slope requirements as part of the RCRA cap.

6. **Implementability**

All the Alternatives can be implemented. There are qualified environmental firms with the necessary equipment and personnel available to implement Alternatives 3, 4, and 5. Alternatives 3, 4, and 5 all involve the transport of slag off the site. Alternative 4 has the least amount of slag that needs to be transported. Alternatives 3 and 5 would both require the removal of 100,000 tons of slag (and an estimated 1 foot of soil beneath the pile). This amount of slag may require the use of more than one landfill in order to implement either of these two alternatives. In the case of Alternative 3 the slag would be transported to a RCRA landfill for disposal. During the emergency removal action in 2000 EPA transported over 13,000 tons of contaminated soil, slag, and debris to a RCRA permitted landfill in upstate New York. In the case of Alternative 5 the slag would be transported to a nonhazardous waste landfill for disposal. The amount of time to implement Alternatives 3 and 5 will depend on the availability of trucks on a regular basis to transport the slag material and the efficiency of the loading operations. The

FSP site is located near Interstate 95 which would allow for convenient access for trucks. Other alternatives for transporting the slag could include by railcar or by ship; however, these transportation options were not evaluated in the FS. The FSP site is located across the street from the Tioga Marine Terminal and there are railroad tracks to the north of the Site. For the implementation of Alternatives 3 and 5 there is limited space available for people, equipment, and trucks to operate to remove and transport the slag, since the slag pile covers much of the property. Available space from neighboring properties may need to be evaluated as locations to store equipment and materials in order to implement Alternative 3, 4, and 5. Alternatives 3, 4, and 5 would require the use of standard construction equipment such as excavators and dozers.

Alternative 5 would be more difficult to implement than Alternative 3, since it involves the on-site treatment of the slag to meet TCLP requirements. An appropriate stabilization agent and mix ratio would need to be determined during treatability testing. There are standard commercial products available to stabilize the metals in the slag such as cement, lime-kiln, or phosphate chemicals. The slag would be mixed with a stabilizing agent on-site. Stabilization on-site may require equipment such as disc-ers and pugmills. Again, the slag pile encompasses most of the property so there is not much available space to excavate, treat, and transport the slag. The slag would need to be sampled and analyzed by TCLP to confirm that the treated slag is no longer a hazardous material. Sampling and analyzing the treated slag by TCLP adds another step to Alternative 5 that is not part of Alternatives 3 and 4. The on-site stabilization and turn around time for TCLP results are two parts of Alternative 5 that could add more time to implement this alternative.

There are environmental companies that have experience installing RCRA caps for Alternative 4. Additionally, the equipment and materials needed for implementing Alternative 4 are standard. Equipment would include excavators, dozers, and loaders and the materials (polyethylene liner and soil) are commercially available. During the emergency removal action in 2000 EPA covered the pile with a HDPE liner. The equipment, personnel, and materials are available to implement Alternative 4. As is the case in Alternatives 3 and 5, the site is located near Interstate 95 which is convenient for transporting materials off or onto the site. Also, as mentioned for Alternatives 3 and 5, there is limited space available on-site to store the capping materials and equipment, since the slag pile covers much of the property.

7. **Costs**

The total net present worth for Alternatives 3, 4, and 5 which satisfy the threshold criteria ranges from $5,650,000 to $31,000,000. Alternative 3 with a cost of $31,000,000 is the most expensive alternative to implement. Alternative 4 with a cost of $5,650,000 is the least expensive alternative to implement. Comparing Alternative 3 and 5, both off-site removal alternatives, Alternative 3 is almost twice as expensive as Alternative 5. Alternative 3 costs $31,000,000 and Alternative 5 costs $18,000,000 based on the location where the slag is treated either off-site in Alternative 3 or on-site in Alternative 5. Alternative 4 is three times less expensive than Alternative 5 and six times less expensive than Alternative 3.

8. **State Acceptance**

The Commonwealth of Pennsylvania has reviewed the Proposed Plan and will formally respond to the selected remedy prior to the issuance of the Record of Decision.

9. **Community Acceptance**

The Community Acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the Record of Decision.

EPA met with the City of Philadelphia in June 2006 and provided information on all the alternatives EPA was evaluating. In response to the meeting, the City of Philadelphia provided a letter to EPA stating that it preferred Alternative 3, complete removal and off-site treatment and disposal. The City also stated in its letter that it did not support an alternative of treating and disposing of the slag in the PWD lagoons.

PREFERRED ALTERNATIVE

The Preferred Alternative for the Franklin Slag Pile Site is Alternative 4, RCRA Cap. Alternative 4, RCRA Cap, would include the removal of the current HDPE cover and disposal of the cover in a nonhazardous waste landfill. In order to meet the slope requirements for the covered slag pile, slag would be excavated, transported, treated, and disposed at a RCRA landfill. The slag is a hazardous waste by characteristic, since the lead values exceed the TCLP standard of 5 mg/l. As a result, the excavated material would be transported by trucks to a RCRA landfill. At the RCRA landfill, the slag as a RCRA characteristic waste would be treated to meet the TCLP criteria and then disposed. It is estimated that 10% of the slag could be removed to meet the slope requirements. An appropriate multilayer RCRA cover will be developed during the remedial design. RCRA covers typically consist of a single geosynthetic clay liner (GCL); a single 60-millimeter LLDPE (linear low density polyethylene) friction membrane; and a 24-inch layer of soil which would be seeded with vegetation such as grass. To the extent practicable native species would be planted on the cover. A fence would be used to limit access. Long-term monitoring and maintenance of the cap would be conducted. Long-term monitoring and maintenance would include site inspections to evaluate the cover and drainage. Also, as part of the RCRA landfill closure requirements, groundwater wells would be installed and groundwater would be monitored for the long-term. During the remedial design, the appropriate number and locations for the groundwater wells will be determined. The groundwater wells will be installed during the remedial design and sampled in order to collect a baseline set of data prior to the construction of the remedy. Also, during the remedial design additional locations will be sampled to further characterize the metals levels in background locations. In addition, institutional controls, (such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP) would be implemented in order to protect the remedy and prevent exposure to site contaminants. In addition to the regular site maintenance and monitoring, five-year reviews would be conducted to evaluate site conditions, since contaminants would be left in place. Once

construction begins, it would take about a year to implement Alternative 4.

The Preferred Alternative was selected because it will protect human health and the environment by covering the slag pile with a RCRA cap and will comply with ARARs for covering hazardous substances. In terms of the balancing criteria, Alternative 4 provides long-term effectiveness and permanence by installing a RCRA cap that is designed for long-term and permanent protection. Alternative 4 is effective in the short-term since appropriate PPE and monitoring will be utilized to prevent exposure to construction workers and offsite migration of contaminants during the period when the cover is removed and replaced with the cap. Alternative 4 is also implementable since a RCRA cap is technically and administratively feasible to implement and there are qualified environmental firms with the personnel and equipment available to implement the alternative. Alternative 4 is least costly of the alternatives that protects human health and the environment and meets ARARs. Cost elements including the unit costs and total costs by item for Alternative 4 are presented in detail in Table 3.

The Preferred Alternative was selected because it will protect human health and the environment by covering the slag pile with a RCRA cap and by complying with ARARs. Alternative 4 would comply with the substantive provisions of the following major ARARs:

1. Fugitive dust emissions generated during the remedial action would comply the requirements of the EPA-approved Philadelphia State Implementation Plan ("SIP"), 40 C.F.R. Part 52, Subpart NN, Section 52.2020(c)(3). These Philadelphia regulations include Regulation II, Section VIII and 25 PA Code §§ 123.1 and 123.2. Particulates generated during the remedial action would comply with the National Ambient Air Quality Standards which are incorporated in the EPA-approved SIP, 40 C.F.R. §§ 50.6, 50.7 and 52.21(j). These regulations include 25 PA Code §§ 1131.2, 131.3 and 131.4.

2. RCRA requirements for the preferred alternative are found in Pennsylvania's EPA-authorized RCRA regulations. References herein to federal requirements, 40 C.F.R. Parts 260, 262, 264 and 268, are incorporated by reference into Pennsylvania's authorized regulations. In particular, to the extent that slag will be staged in containers prior to off-site disposal, the preferred alternative will comply with 40 C.F.R. § 262.34 (accumulation time and requirements), 40 C.F.R. §§ 264.171-175 and 25 PA Code § 264a.173 (Containers) and 40 C.F.R. Part 264, Subpart E (Storage of LDR Wastes). Capping of the landfill, including closure and post-closure care, would comply with 40 C.F.R. Part 264, Subpart G (Closure and Post-Closure Care) and 40 C.F.R. § 264.310 (Landfills).

3. The preferred alternative would comply with the RCRA requirements for groundwater monitoring found at 40 C.F.R. §§ 264.97-99 and 25 PA Code § 264a.97.

4. Since the Site lies in the 100-year floodplain, the preferred alternative would comply with 40 C.F.R. § 264.18(b) .

Based on the information available at this time, EPA believes that the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. EPA expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA 121 (b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; and 4) utilize permanent solutions.

The Preferred Alternative could be modified in response to public comment or new information.

COMMUNITY INVOLVEMENT

A public comment period on this Proposed Plan will open on **July 19, 2007** and close on **August 17, 2007**. During this time, the public is encouraged to submit comments to the EPA on the Proposed Plan. All comments submitted must be postmarked by **August 17, 2007** and sent to:

US EPA Region III
Kristine Matzko (3HS21)
1650 Arch Street
Philadelphia, Pennsylvania 19103
or
matzko.kristine@epa.gov

A public meeting to discuss the Proposed Plan will be held on **July 25, 2007** at **6:30 p.m.** at the **St. George Parish Hall, 3570 Salmon Street, Philadelphia, PA 19134**. If you have any questions about the public meeting, contact Kristine Matzko or Trish Taylor at the telephone numbers or e-mails listed:

Kristine Matzko, EPA
phone: 215-814-5719
matzko.kristine@epa.gov

Trish Taylor, EPA
phone: 215-814-5539
taylor.trish@epa.gov

The Remedial Investigation and Feasibility Study Reports and the Proposed Plan for the Franklin Slag Pile Superfund Site, as well as other documents are available to the public at the information repository at the EPA Region III offices in Philadelphia, Pennsylvania.

A copy of the Administrative Record file is located in the library at the EPA Region III office in Philadelphia, Pennsylvania and the Port Richmond library at the following addresses.

EPA Region III
1650 Arch Street
Attn: Anna Butch
Administrative Record Center (6th Floor)
Philadelphia, Pennsylvania 19103
phone: 215-814-3157

Port Richmond Branch of the Philadelphia
Free Public Library
2987 Almond Street
Philadelphia, Pennsylvania 19134
phone: 215-685-9992

The Administrative Record can also be accessed via the internet by going to the following website address: http://www.epa.gov/arweb

General information on the Franklin Slag Pile site can be found at EPA's website: http://www.epa.gov/reg3hwmd/super/sites/PASFN0305549/index.htm

List of Acronyms for Franklin Slag Pile Proposed Plan

AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulation
COPCs	Chemicals of Potential Concern
CWA	Clean Water Act
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
FS	Feasibility Study
FSP	Franklin Slag Pile
FSRC	Franklin Smelting and Refining Corporation
HDPE	High Density Polyethylene
HI	Hazard Index
HMAU	Hazardous Materials Administrative Unit
HQ	Hazard Quotient
IC	Institutional Control
LLDPE	Linear Low Density Polyethylene
MDC	MDC Industries
mg/l	milligrams per liter
mg/Kg	milligrams per Kilogram
NAAQS	National Ambient Air Quality Standard
NEWPCP	Northeast Water Pollution Control Plant
NPL	National Priorities List
O&M	Operation and Maintenance
ORD	Office of Research and Development
PADEP	Pennsylvania Department of Environmental Protection
PADOH	Pennsylvania Department of Health
PHA	Public Health Assessment
PCBs	Polychlorinated Biphenyls
PGW	Philadelphia Gas Works
PM10	airborne particulate matter less than 10 micrometers in diameter
PPE	Personal Protective Equipment
PWD	Philadelphia Water Department
RAOs	Remedial Action Objectives
RBCs	Risk Based Concentrations
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RfD	Reference Dose
ROD	Record of Decision
SIP	State Implementation Plan

SVOC	Semi-Volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TSP	Triple Sodium Phosphate
µg/m3	microgram per cubic meter of air
µg/dl	micrograms of lead per deciliter of blood
USC	United States Code
VOC	Volatile Organic Compound
WPD	Water Protection Division

Table 3 - Alternative 4 RCRA Cap

This table includes the costs for Alternative 4, RCRA Cap for the Franklin Slag Pile. For each part of the alternative the Table lists the items such as excavation, the unit cost, and the total costs.

FRANKLIN SLAG PILE
PHILADELPHIA, PENNSYLVANIA
EPA REGION III
ALTERNATIVE 4: RCRA CAP
Capital Cost

	Item	Quantity	Unit	Unit Cost	Total Cost
1	**PROJECT PLANNING**				
	Prepare Construction Plan	200	hr	$25.00	$5,000
	Prepare Deed Restrictions	40	hr	$25.00	$1,000
1.3	**GROUNDWATER MONITORING**				
1.3.1	Mob/Demob	1	ls	$5,000.00	$5,000
1.3.2	Drilling	120	ft	$20.00	$2,400
1.3.3	4" Steel Casing	120	ft	$20.00	$2,400
1.3.4	2" PVC Well Installation	160	ft	$12.00	$1,920
1.3.5	Well Completions	4	ea	$300.00	$1,200
1.3.6	Well Development	8	hr	$250.00	$2,000
1.3.7	Waste Handling (cuttings)	10	drums	$75.00	$750
1.3.8	Waste Handling (water)	500	gal	$1.00	$500
1.3.9	Sampling	2	ea	$2,100.00	$4,200
2	**MOBILIZATION/DEMOBILIZATION AND FIELD SUPPORT**				
2.1	Office Trailer	8	mo	$203.50	$1,628
2.2	Storage Trailer	8	mo	$105.00	$840
2.3	Site Survey, Aerial	1	ls	$5,940.00	$5,940
2.4	Interim Grading and Final Surveys	4	ac	$1,150.00	$4,600
2.5	Equipment Mobilization/Demobilization	6	ea	$238.50	$1,431
2.6	Site Utilities	8	mo	$427.00	$3,416
2.7	Truck Scale	2	mo	$3,175.00	$6,350
2.9	Street Sweeper	8	mo	$950.00	$7,600
2.9	Remove fence, decon and disposal	1	ls	$5,000.00	$5,000
3	**DECONTAMINATION**				
3.1	Equipment Decon Pad	1	ls	$13,150.00	$13,150
3.2	Decontamination Services	7	mo	$2,325.00	$16,275
3.4	Decon Water Storage Tank, 6,000 gallon	7	mo	$635.00	$4,445
3.5	Clean Water Storage Tank, 4,000 gallon	7	mo	$570.00	$3,990
3.6	Disposal of Decon Waste (liquid & solid)	7	mo	$900.00	$6,300
3.7	Tarp as Daily Cover	900	sf	$0.57	$513
3.8	Spray Truck for Dust Suppression	7	mo	$2,200.00	$15,400
3.9	Water for Dust Suppression, 1000 gal/month	7,000	gal	$0.20	$1,400
4.6	Laborer, Dust Control and Site Maintenance	7	mo	$4,503.20	$31,522
4	**EXCAVATION**				

4.1	Excavators, two, 1 1/2 CY capacity each (with operator)	2	mo	$22,884.50	$45,769
4.2	Dozer, 140 H. P. (with operator)	1	mo	$17,494.26	$17,494
5	**DISPOSAL**				
5.1	Removed Geomembrane Transportation and Disposal	17	tons	$65.00	$1,073
5.2	Roll-Off Box for Geomembrane	1	mo	$750.00	$750
5.3	Hazardous Waste Transportation and Off-Site Disposal	12,930	tons	$162.50	$2,101,125
5.4	Waste Characterization Testing (TCLP),1 per 1000 cy	9	ea	$855.00	$7,695
6	**SITE REGRADING & CAP**				
6.1	Dozer, 140 H. P.	4	mo	$17,494.26	$69,977
6.2	Front End Loader, 2 C. Y.	4	mo	$17,285.25	$69,141
6.3	Vibratory Roller	4	mo	$13,804.00	$55,216
6.6	Install GCL	104,450	sf	$0.75	$78,338
6.7	Install 60 mil textured LLDPE	104,450	sf	$0.70	$73,115
6.8	Install geocomposite drainage layer	104,450	sf	$0.75	$78,338
6.9	Drainage layer outlet trench w/ corrugated pipe	1,330	lf	$3.11	$4,136
6.10	Soil, 18" thick	5,803	cy	$8.16	$47,351
6.11	Spread/Compact Soil	5,803	cy	$1.24	$7,195
6.12	Topsoil, Furnish and Place, 6" thickness	11,606	sy	$3.98	$46,190
6.13	Fine Grading and seeding, incl. lime, fert, and seed	11,606	sy	$1.86	$21,621
6.14	Install Fencing, 6' High	1,330	ft	$15.09	$20,070
6.15	Install Double Swing Gate, 6' High, 12' Opening	1	ea	$962.00	$962
8	**MISCELLANEOUS**				
8.1	Construction Oversite (5p*5days*8 months)	866	days	$160.00	$138,560
8.2	Post Construction Documents	250	hr	$25.00	$6,250
	Subtotal				$3,046,536
	Local Area Adjustments				
	Overhead (30% labor) and G&A (10% all costs)				$413,673
	Total Direct Cost				$3,460,209
	Indirects on Total direct Costs (minus transport & Disposal) @ 35%				$475,041
	Profit on Total Direct Cost @ 10%				$346,021
	Subtotal				$4,281,271
	Health & Safety Monitoring @	2%			$85,625
	Total Field Cost				$4,366,896
	Contingency on Total Field Costs @	20%			$873,379

Engineering on Total Field Cost (minus transport and disposal) @	10%	$226,395
TOTAL COST		**$5,466,670**

KEY TO ABBREVIATIONS:

hr = hour
mo = month
ls = lump sum
ac = acre
ea = each
sf = square feet
gal = gallon
cy = cubic yards
lf = linear feet
sy = sqyare yards
ft = feet
G&A = general and administrative costs